

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A data embedding device for embedding objective data to be embedded in a speech code obtained by encoding a speech in accordance with a speech encoding method based on a voice generation process of a human being, comprising:

an embedding judgment unit, for every speech code, to judge whether or not data should be is embedded in the a speech code is capable of embedding data based on a plurality of parameter codes constituting the a liner spectrum pair (LSP) code, a pitch lag code, a fixed code and a gain code included in a past speech code output from a code excited linear prediction encoder, ~~the plurality of parameter codes including an LSP code, a pitch lag code, a fixed code and a gain code;~~ and

an embedding unit to embed data ~~should to be embedded in two or more parameter codes a part of a LSP code, a pitch lag code and a fixed code,~~ defined as embedding object parameter codes, among ~~the plurality of parameter codes constituting the a~~ speech code for which it is judged by the embedding judgment unit that ~~the data should be embedded a~~ speech code is capable of embedding data, wherein ~~the embedding object parameter codes include a part of the LSP code, the pitch lag code and the fixed code,~~ and the embedding unit replaces the embedding object parameter codes with the data ~~should to be~~ embedded.

2. (currently amended) The data embedding device according to claim 1, wherein the embedding judgment unit, for every frame defined in accordance with

the speech encoding method, judges whether the frame is a frame of a speech section, or a frame of a non-speech section, and the embedding unit executes a process for embedding the data ~~should to~~ be embedded in the speech code of the frame of the non-speech section.

3. (currently amended) A data extraction device for extracting data embedded in a speech code, comprising:

an extraction judgment unit to, ~~for~~ every speech code, judge whether or not data is being embedded in ~~[[the]]~~ a speech code based on a liner spectrum pair (LSP) code, a pitch lag code, a fixed code and a gain code included in a past speech code output from a code excited linear prediction encoder; and

an extraction unit to extract data being embedded in ~~two or more parameter codes a part of a LSP code, a pitch lag code and a fixed code,~~ defined as embedding object parameter codes, among a ~~plurality of parameter codes constituting the~~ speech code for which it is judged by the extraction judgment unit that data is being embedded, ~~wherein the plurality of parameter codes including an LSP code, a pitch lag code, a fixed code and a gain code that is outputted from a code excited linear prediction encoder, the embedding object parameter codes include a part of the LSP code, the pitch lag code and the fixed code.~~

4. (previously presented) The data extraction device according to claim 3, wherein the extraction judgment unit, for every frame defined in accordance with a speech encoding method of the speech code, judges whether the frame is a frame

of a speech section, or a frame of a non-speech section, and the extraction unit executes a process for extracting data from the speech code of the frame judged to be the frame of the non-speech section.

5. (currently amended) A data embedding/extraction device for executing a process for embedding data in a speech code and a process for extracting embedded data from the speech code, comprising:

an embedding judgment unit to, for every speech code, judge whether or not data should be embedded in the a speech code is capable of embedding data based on a plurality of parameter codes constituting the a linear spectrum pair (LSP) code, a pitch lag code, a fixed code and a gain code included in a past speech code output from a code excited linear prediction encoder, ~~the plurality of parameter codes including an LSP code, a pitch lag code, a fixed code and a gain code;~~

an embedding unit to embed data in ~~two or more parameter codes a part of a~~ LSP code, a pitch lag code and a fixed code, defined as embedding object parameter codes, among ~~the plurality of parameter codes constituting the a~~ speech code for which it is judged by the embedding judgment unit that ~~the data should be embedded a~~ speech code is capable of embedding data, wherein ~~the embedding object parameter codes include a part of the LSP code, the pitch lag code and the fixed code, and the embedding unit replaces the embedding object parameter codes with the data should to~~ be embedded;

an extraction judgment unit to, for every speech code, judge whether or not data is being embedded in [[the]] a speech code based on a LSP code, a pitch lag

code, a fixed code and a gain code included in a past speech code output from a code excited linear prediction encoder; and

an extraction unit to extract data being embedded in ~~the two or more parameter codes of the~~ a part of a LSP code, a pitch lag code and a fixed code ~~among a~~ speech code for which it is judged by the extraction judgment unit that data is being embedded.

6. (currently amended) A data embedding method for embedding data in a speech code, comprising:

judging whether or not ~~data should be embedded in the~~ a speech code is ~~capable of embedding data~~ based on ~~a plurality of parameter codes constituting the a linear spectrum pair (LSP) code, a pitch lag code, a fixed code and a gain code included in a past~~ speech code output from a code excited liner prediction encoder; ~~the plurality of parameter codes including an LSP code, a pitch lag code, a fixed code and a gain code;~~ and

embedding data in ~~two or more parameter codes~~ a part of a LSP code, a pitch lag code and a fixed code, defined as embedding object parameter codes, among ~~the plurality of parameter codes constituting the~~ a speech code for which it is judged that ~~data should be embedded~~ a speech code is capable of embedding data, wherein ~~the embedding object parameter codes include a part of the LSP code, the pitch lag code and the fixed code,~~ and the embedding includes replacing the embedding object parameter codes with the data ~~should to~~ be embedded.

7. (currently amended) The data embedding method according to claim 6, further comprising, for every frame defined in accordance with a speech encoding method of the speech code, judging whether the frame is a frame of a speech section, or a frame of a non-speech section, and executing a process for embedding the data ~~should to~~ be embedded in the speech code of the frame of the non-speech section.

8. (currently amended) A data extraction method for extracting embedded data from a speech code, comprising:

judging whether or not data is being embedded in ~~[[the]]~~ a speech code based on a liner spectrum pair (LSP) code, a pitch lag code, a fixed code and a gain code included in a past speech code output from a code excited linear prediction encoder; and

extracting data being embedded in ~~two or more parameter codes~~ a part of a LSP code, a pitch lag code and a fixed code, defined as embedding object parameter codes, among ~~a plurality of parameter codes constituting the~~ a speech code for which it is judged that data is being embedded, ~~wherein the plurality of parameter codes including an LSP code, a pitch lag code, a fixed code and a gain code that is outputted from a code excited linear prediction encoder, the embedding object parameter codes include a part of the LSP code, the pitch lag code and the fixed code.~~

9. (previously presented) The data extraction method according to claim 8, further comprising, for every frame defined in accordance with the speech encoding method of the speech code, judging whether the frame is a frame of a speech section, or a frame of a non-speech section, and executing a process for extracting the data being embedded in the speech code of the frame judged to be the frame of the non-speech section.

10. (currently amended) A data embedding/extraction method with respect to a speech code obtained by encoding a speech in accordance with a speech encoding method based on a voice generation process of a human being, comprising:

judging, for every speech code, whether or not ~~data should be embedded in the a~~ speech code is capable of embedding data based on ~~a plurality of parameter codes constituting the a~~ linear spectrum pair (LSP) code, a pitch lag code, a fixed code and a gain code included in a ~~past~~ speech code output from a code excited linear prediction encoder, ~~the plurality of parameter codes including an LSP code, a pitch lag code, a fixed code and a gain code;~~

embedding data in ~~two or more parameter codes a part of a LSP code, a pitch lag code and a fixed code,~~ defined as embedding object parameter codes, among ~~the plurality of parameter codes constituting the a~~ speech code for which it is judged that ~~the data should be embedded a~~ speech code is capable of embedding data, wherein ~~the embedding object parameter codes include a part of the LSP code, the~~

~~pitch lag code and the fixed code, and the embedding unit replaces the embedding object parameter codes with the data should to be embedded;~~

judging, for every speech code, whether or not data is being embedded in [[the]] a speech code based on a LSP code, a pitch lag code, a fixed code and a gain code included in a past speech code output from a code excited linear prediction encoder; and

extracting data being embedded in ~~the two or more parameter codes of the a~~ part of a LSP code, a pitch lag code and a fixed code among a speech code for which it is judged ~~by the extraction judgment unit~~ that data is being embedded.

11-20. (cancelled)